Survival Skills

II. Laboratory Safety

A Primer on Safe Laboratory Practice and Emergency Response for CDC Workers

Safety Survival Skills

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OhASIS

Office of Health and Safety Information System
http://intranet.cdc.gov/ohs/

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Laboratory Hazards

The laboratory environment is a hazardous place to work. Walk through any laboratory door and you are confronted with a wide array of chemicals, biologics, and instrumentation. Nearly every common laboratory technique, practice, or procedure carries some risk of exposure or mechanical injury. Appreciating what these risks are and how to work safely with them is the focus of this manual.

Safety Incident

"I was cleaning paper out of drain in the sink with gloves on when I was pricked by a piece of glass on the left thumb.

Lab Hazards

- Biological
- Chemical
- Ionizing Radiation
- Physical

The Most Hazardous "Dirty Dozen" Chemicals*

- Organic azides
- Perchlorate salts of organic, organometallic, and inorganic complexes
- Diethyl ethers
- Lithium aluminum hydride
- Sodium, potassium
- Potassium metal
- Sodium-benzophenone ketyl still pots
- Palladium on carbon
- Heat generated from exothermic reactions
- Ethers with alpha hydrogen atoms
- Carbon monoxide
- Organic peroxides

Safety Incident

Laboratorian is heating ethyl ether in a beaker on a hot plate in a fume hood. As more liquid ether is being added to the beaker, the hot plate thermostat engages and ignites the ether fumes.

*Laboratorians should consult with OHS before working with these chemicals.

Laboratorians should never assume that they are performing all tasks in a safe and correct manner just because they have never had a laboratory accident. Both the hazard and the route of transmission should be known before beginning any laboratory procedure. Unfortunately, shortcuts are taken, materials are viewed as non-hazardous the longer they are worked with, and equipment is assumed to be functioning properly when they are turned on.

Safety Incident

"I was working with infant mice infected with Strep. pneumoniae, trying to draw blood from the tail vein with a monolet lancet. I pushed down too hard and it went through the tail and into the nuckle of my left middle finger."

Most Frequent Lab Accidents

- Splashes/Spills
- Needlesticks/Cuts
- Back injuries
- Explosions
- Fires
- Exothermic reactions
- Toxic fumes
- Mouth pipetting
- Animal bites/Scratches

Recent studies have shown that there are definite differences in how various people view safety.

Laboratory Workers

- **Unsafe Workers**
  - have low opinion of safety programs
  - take excessive risks
  - work too fast
  - less aware of infectious risks
  - young males (17-24 years of age)
- **Safe Workers**
  - know and adhere to safety regulations
  - have "defensive" work habits
  - recognize potentially hazardous situations
  - women and older employees (45-64 years of age)

Risk Assessments

Prior to beginning any laboratory procedure, laboratorians should gather all available information concerning the materials they will be working with and perform a risk assessment of their methods.

Safety Statistic

In 1999, 69 CDC laboratorians were treated at the Occupational Health Clinic for a variety of laboratory incidents.

1. **Identify** all hazardous materials (microbiologicals and chemicals) to be used and the circumstances for their use.
2. **Consult** information resources (BMBL, MSDS).
3. **Evaluate** the biosafety level and/or type of toxicity of the material.
4. **Consider** possible routes of exposure.
5. **Evaluate** quantitative information on toxicity.
6. **Select** appropriate procedures to minimize exposure.
7. **Prepare** for contingencies.

Basic Biosafety

Microbiological laboratories are special, often unique work environments that may pose identifiable infectious disease risks to persons in or near them. Infections have been contracted in the laboratory throughout the history of microbiology. Published reports around the turn of the century described laboratory-associated cases of typhoid, cholera, glanders, brucellosis, and tetanus.

The term “containment” is used in describing safe methods for managing infectious materials in the laboratory environment where they are being handled or maintained. The purpose of containment is to reduce or eliminate exposure of laboratory workers, other persons, and the outside environment to potentially hazardous agents. Primary containment, the protection of personnel and the immediate laboratory environment from exposure to infectious agents, is provided by both good microbiological technique and the use of appropriate safety equipment. The use of vaccines may provide an increased level of personal protection. Secondary containment, the protection of the environment external to the laboratory from exposure to infectious materials, is provided by a combination of facility design and operational practices. Therefore, the three elements of containment include laboratory practice and technique, safety equipment, and facility design. The risk assessment of the work to be done with a specific agent will determine the appropriate combination of these elements.

The “Biohazard” symbol ***must*** *be affixed to any container or equipment used to store or transport potentially infectious materials.*

Biosafety Level (BSL)

The recommended biosafety level(s) for the organisms represent those conditions under which the agent ordinarily can be safely handled. The laboratory director is specifically and primarily responsible for assessing the risks and appropriately applying the recommended biosafety levels. When specific information is available to suggest that virulence, pathogenicity, antibiotic resistance patterns, vaccine and treatment availability, or other factors are significantly altered, more (or less) stringent practices may be specified.

- **BSL1** - work with agents not known to cause disease in healthy adults; “standard microbiological practices SMP)” apply; no safety equipment required; sinks re-quired.
- **BSL2** - work with agents associated with human disease; SMP apply plus limited access, biohazard signs, sharps precautions, and biosafety manual required; BSC used for aerosol/

splash generating operations; lab coats, gloves, face protection required; contaminated waste is autoclaved.

- **BSL3** - work with indigenous /exotic agents which may have serious or lethal consequences and with potential for aerosol transmission; BSL2 practices plus controlled access; decontamination of all waste and lab clothing before laundering; determination of baseline serums; BSC used for all specimen manipulations; respiratory protection used as needed; physical separation from access corridors; double door access; negative airflow into lab; exhaust air not recirculated.
- **BSL4** - work with dangerous/exotic agents of life threatening nature or unknown risk of transmission; BSL3 practices plus clothing change before entering lab; shower required for exit; all materials are decontami-nated on exit; positive pressure personnel suit required for entry; separated/isolated building; dedicated air supply/exhaust and decon systems.

Each of the four biosafety levels (BSLs) consist of combinations of laboratory practices and techniques, safety equipment, and laboratory facilities. Each combination is specifically appropriate for the operations performed, the documented or suspected routes of transmission of the infectious agents, and the laboratory function or activity. However, common to all four biosafety levels are the “Standard Practices” which remain the same from BSL1 to BSL4.

- **Standard Practices**

1. Access to lab is limited or restricted by the lab director when work with infectious agents is in progress.
2. Persons wash their hands after handling viable material and animals, after removing gloves, and before leaving lab.
3. Eating, drinking, smoking, handling contact lenses, and applying cosmetics are not permitted in work areas.
4. Mouth pipetting is prohibited.
5. All procedures are performed to minimize aerosol or splash production.
6. Work surfaces are decontaminated daily and after any spill of viable material.
7. All cultures, stocks, and other regulated wastes are decontaminated before disposal by an approved decontamination method such as autoclaving.
8. An insect and rodent control program is in effect.
9. BSCs are used whenever there is a potential for aerosol /splash creation or when high concentrations/large volumes of infectious agents are used.
10. Face protection is used for anticipated splashes/

Safety Incident

Laboratorian is working alone with Neisseria meningitis sp, concentrating it using a bench-top centrifuge prior to alloquoting into cryovials and final freezer storage. Several days later, laboratorian develops extremely high fever and chills, reports to emergency room, is admitted, and comes within two hours of dying from agent they were working with.

sprays to the face.

11. Lab coats/gowns/smocks/uniforms are worn while in the lab.

12. Gloves are worn when handling infected animals and when hands may come in contact with infectious materials, contaminated equipment, or surfaces.

13. All infectious/regulated waste is decontaminated via autoclave, chemical disinfection, incinerator, or other approved method.

- **Safe Operations**

• Biohazard warning signs listing responsible laboratory personnel and infectious agents are posted on all laboratory access doors.

• OSHA requires the wearing of personal protective safety glasses whenever working with or around hazardous materials.

• Sandals and open-toe shoes are not appropriate footwear in the laboratory.

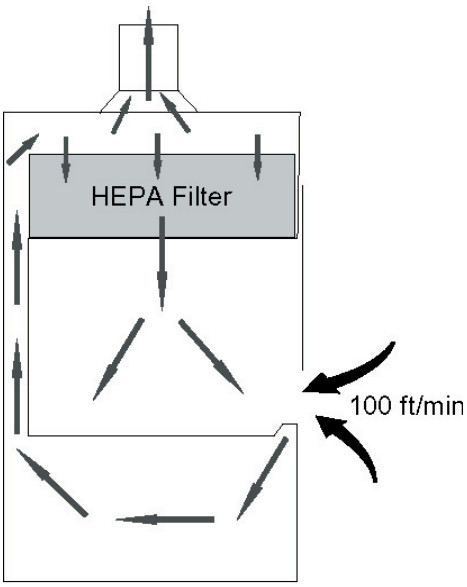
• All laboratory materials (lab coats, gloves, eyewear, etc.) remain in the laboratory unless properly decontaminated.

Safety Incident

Laboratorian is streaking agar plates with suspected multi-drug resistant organism. Laboratorian wakes during the night in severe gastric distress; is admitted to hospital and treated for several days; testing reveals agent they worked with.
Investigation reveals probable contamination of lab coat cuff during plating activities followed by wrist/hand contamination.

Biological Safety Cabinets (BSC)

Properly maintained BSCs, when used in conjunction with good microbiological techniques, provide an effective containment system for safe manipulation of moderate and high-risk microorganisms (Biosafety Level 2 and 3 agents). Both Class I and II BSCs have inward face velocities (75-100 linear feet per minute) that provide comparable levels of containment to protect



BSC Airflow

H-*high*
E - *efficiency*
P - *particulate*
A - *air*

laboratory workers and the immediate environment from infectious aerosols generated within the cabinet. Class II BSCs also protect the research material itself through high-efficiency particulate air filtration (HEPA filtration) of the air flow down across the work surface (vertical laminar flow). Class III cabinets offer the maximum protection to laboratory personnel, the community, and the environment because all hazardous materials are contained in a totally enclosed, ventilated cabinet.

- **Procedure**

1. Turn cabinet on and allow to run for 15-20 min.; check for proper air movement.
2. Load cabinet with supplies/equipment for work.
3. Perform work.
4. Remove work materials from cabinet.
5. Decontaminate cabinet with 1% bleach followed by soap & water.
6. Allow cabinet to run for 15-20 min. before shutdown.

- **Safe Operations**

• Always enter “straight” into the cabinet; do not make “sweeping” motions.

• Place materials and discard pan well inside the cabinet and not on the front grill.

• Monitor and anticipate disruptions to the laminar airflow. Alert other persons to limit their activities in the immediate vicinity.

• Decontaminate materials before removal from cabinet.

• Large Bunsen burners are not recommended for use within cabinets because they disrupt the air flow.

• Do not use volatile chemicals within cabinets when also using open flames or other ignition sources (e.g. thermostat controlled hot plates).

• Report suspected malfunctions promptly to the Office of Health and Safety (404-639-2453).

Centrifuges

- **Procedure**

1. Check centrifuge tubes for cracks/chips before use.
2. Do not fill centrifuge tubes to the very top of the tube.
3. Tightly seal all centrifuge tubes or use safety cups/buckets to prevent aerosol escape.
4. Take care that matched sets of buckets, adapters, and plastic inserts are kept together.

5. Ensure that rotors are “locked” to the spindle and buckets are “seated” before operation.

6. Use a biological safety cabinet (BSC) to load and open tubes, safety cups, and buckets when working with biohazardous materials. Decontaminate tubes, safety cups, and buckets before removal from the BSC and transport to the centrifuge.

7. Close the centrifuge top during operation.

8. Allow the centrifuge to come to a complete stop before opening.

9. Disinfect weekly and immediately following any spill or breakage the surfaces of the centrifuge head, bowl, trunnions, and buckets. Use 70% alcohol, 2% glutaraldehyde, or any registered mycobactericidal. For radioactive contamination, use equal parts of 70% ethanol, 10% SDS, and water, followed by water rinses and drying with a soft cloth. Dupont COUNT-OFF and other radioactive decontaminates must not be used on aluminium rotors as they will remove the anodized coatings.

- **Ultra Centrifuges (*In addition to the above*):**

1. Clean rotors, lids, adapters, and associated parts with 1% non-alkaline detergent, rinse with distilled water, and dry with a soft cloth. Encrusted material should be removed with a twist bristle brush and 1% non-alkaline soap solution.

2. Lubricate weekly all O-rings with vacuum grease and metal rotor threads with anti galling grease.

3. Make sure that rotors are locked to the spindle and that buckets are properly seated on their pins. Only use the rotor handle tool to tighten ultraspeed lids.

4. Do not use rotors which have been dropped or struck against a hard surface.

5. Contact your centrifuge representative for specific information.

Safety Incident

“Laboratorian was spinning Sabia arenavirus when the tube broke. He opened the centrifuge, cleaned up the spill but did not notify anyone of the incident. 24 days later, the laboratorian reports to hospital with 103^0 temperature; is admitted, and diagnosed with Sabia arenavirus infection. He now notifies authorities of previous incident and eighty people were subsequently monitored for the disease.

Biological Waste Disposal*

- **Procedure:**

1. Line discard pan with appropriately sized ***clear*** autoclave bag.

2. Fold upper part of bag over the side of the pan.

3. Add waste - keep pan covered when not in use and do not overfill.

4. When the pan is ~3/4 full, carefully add 250-500 ml of water or germicidal solution. *Avoid splashing!*

5. Twist the bag closed. Do not tie!

6. Replace pan lid and tape closed with autoclave tape.

7. Affix identifying label to end of pan and transport to

Safety Incident

Waste disposal technician retrieves discard pan from Rocky Mountain spotted fever lab. He thought it had been autoclaved and begins to clean it out using a high pressure hose. A friend comes by to pass the time of day. Several days later, both men develop high fevers, report to emergency room and are admitted. Both die of complications of their illness and testing reveals infection with Rocky Mountain spotted fever.

autoclave room. Leave pan in appropriate area for autoclaving.

- **Shipping Containers:**

1. Decontaminate if necessary (autoclave or wipe with disinfectant)
2. Deface biohazard sticker, and
3. Mark outer cardboard container as “TRASH”.

- **Laboratory Equipment:**

1. Decontaminate with an appropriate disinfectant, and
2. Affix “signed” CDC Form 0.593 (Decontamination Sticker) to outside.

- **Safe Operations:**
  - **NEVER** place lab waste in office waste containers.
  - Place ***all*** sharps into “sharps” container.
  - Place all lab waste (pipettes, pipette tips, pipette wrappers, tissue culture flasks, Kimwipes etc.) into appropriate discard pans or discard/autoclave bag.
  - **DECONTAMINATE** discard pans before leaving lab:

a. Disinfect outside
b. Label
c. Tape ends with autoclave tape
d. Secure for transport to autoclave

***Appendix A -** Biological Waste Disposal Chart

Biological Emergencies

- **Surface Contamination**

1. Define/isolate contaminated area.
2. Alert co-workers.
3. Put on appropriate PPE.
4. Remove glass/lumps with forceps or scoop.
5. Apply absorbent towel(s) to spill; remove bulk &reapply if needed.
6. Apply disinfectant* to towel surface.
7. Allow adequate contact time (20 minutes).
8. Remove towel, mop up; clean with alcohol or soap/water.
9. Properly dispose of materials.

10. Notify supervisor and OHS.

- **Personnel Contamination**

1. Clean exposed surface with soap/water, eyewash(eyes), or saline (mouth).
2. Apply first aid and treat as an emergency.
3. Notify supervisor or security desk (after hours).
4. Follow "On-the-Job Injury/Illness Reporting Procedures-".
5. Report to OHC for treatment/counseling.

*1:100 solution of household bleach (hypochlorite) for most spills, 1/10 solution for spills containing large amounts of organic material, or any EPA registered mycobactericidal. Alcohols are not recommended as surface decontaminates because of their evaporative nature which decreases "contact time".

Safety Incident

"After injecting the chimp, the animal tech did not immediately dispose of the injection needle. When he turned to assist the animal caretaker in releasing the animal from the squeeze cage, the caretaker was stuck in the right, 4th finger."
The chimp was chronically in-

Shipping and Packaging Procedures

All biological and chemical reagents, clinical/diagnostic specimens, and infectious substances that are to be shipped locally, nationally, or internationally by CDC staff must be packaged by the "Shipping Activity" of the Scientific Resources Program (SRP), NCID. See appendixes D, E, and F.

More Information?

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■ Rayburn, Stephen R. 1990. *The Foundations of Laboratory Safety: A Guide for the Biomedical Laboratory.* pp. 14-19, pp. 69-71. Springer-Verlag, New York.

■ Veseley, D., Lauer, J. 1986. Decontamination, Sterilization, Disinfection, and Antisepsis in the Microbiology Laboratory, pp. 187-190. *In* Briton M. Miller (ed.), Laboratory Safety: Principles and Practices. American Society for Microbiology, Washington, D.C.

Basic Chemical Safety

The typical chemical laboratory contains a wide range of potentially hazardous substances which may be reactive, toxic, flammable, carcinogenic, or radioactive. And, these substances may produce acute and/or chronic effects. It is therefore imperative that laboratorians always adopt a practice of avoiding all chemical exposures. If the chemical exposure cannot be eliminated, then it should be kept as low as reasonably possible. In general, laboratorians should adopt the following **Golden Rules**:

1. **Plan ahead**

• Have the proper equipment and PPE to safely handle chemicals.

• Substitute less toxic chemicals whenever possible.

- Purchase the minimum quantities possible.
- Determine potential hazards beforehand.
- Have a safety plan for emergencies.

2. **Do not underestimate the risks**

- Read chemical labels and MSDS beforehand.

3. **Minimize exposure**

- Use the smallest quantities of chemicals possible.
- Never smell chemicals/compounds of unknown toxicity.
- Use fume hoods or other ventilation devices.
- Use carrying containers.
- Do not eat/drink in the lab.

4. **Be prepared for accidents**

- Know the location of eye washes, showers, fire extinguishers, and exits.
- Be prepared to provide basic first aid.
- Anticipate the actions of others.
- Remove all jewelry and "snug-up" all loose fitting clothing and ties.

In addition, all persons working with potentially hazardous chemicals, should adopt the following Standard Practices which are similar to those developed for working with potentially infectious microorganisms:

- **Standard Practices**

1. **Cardinal Rule:** *Avoid exposure to all chemicals!* Never allow chemicals to come in contact with unpro-tected skin. Wear protective coats/gowns/aprons,gloves, and eyewear/face shields. Prevent inhalation exposure by using chemical fume hoods or other con-tainment devices for vapors, gases, aerosols, fumes, dusts, or powders.

2. Eye protection and other appropriate PPE are required for **ALL** personnel and visitors in **ALL** locations were chemicals are used and/or stored.

3. Access to the laboratory is limited or restricted by the lab director when work with hazardous chemicals is in progress.

4. Signs identifying hazards in the laboratory and responsible laboratory personnel are posted on all entrances to the laboratory.

5. All laboratories will be maintained in a neat and orderly fashion.

6. Eating, drinking, smoking, handling contact lenses, applying cosmetics, and food are not permitted in work areas.

7. Mouth pipetting is prohibited.

8. Laboratory coats/gowns/smocks/aprons and protective eyewear are worn while in the laboratory. Additional-

Safety Incident

"After adding 10 ml of conc. sulfuric acid to a mixture of 260ml of acetic anhydride and 130 ml of acetic acid, I realized that I had made a mistake. As I turned to discard the mixture into a container by the sink, I tripped over a chair, spilling the contents into the sink. The acid immediately reacted with water in the sink and back-splashed, onto my body."

PPE (specialized gloves, respirators) are worn based on the work being performed.

9. All chemicals are to be stored properly according to recognized compatibilities. Chemicals posing special hazards or risks shall be limited to the minimum quantities required to meet short-term needs and stored under appropriately safe conditions (i.e. flammables- in flammable storage cabinets). Chemicals are not to be stored on the floor or in chemical fume hoods.

10. A chemical inventory (see ImP^{2}ACT) shall be maintained and posted on the door of each lab.

11. Outdated and obsolete chemicals will be disposed via the chemical waste disposal program (ImP^{2}ACT). Ethers and other materials which degrade to unstable compounds shall be shelf dated for disposal 6 months after being opened, but no more than 12 months after purchase, even if unopened, unless processed to prevent dangerous levels of unstable peroxides from forming.

Safety Incident

12. Spill control kits are available and laboratorians instructed in there use. All spills are promptly cleaned up and the affected area decontaminated.

13. All chemical wastes are placed in appropriate and properly labeled containers for disposal through the “Hazardous Chemical Waste Disposal Program”.

14. Emergency exits and access to emergency equipment (fire extinguishers, emergency eye washes/showers) are kept free of obstructions.

15. Work surfaces are cleaned regularly and kept uncluttered.

16. Compressed gas cylinders are secured at all times.

17. All chemical laboratories must have a Chemical Hygiene Plan specific for that laboratory.

More Information?

■ *Prudent Practices in the Laboratory: Handling and Disposal of Chemicals*, *Nat. Academy Press (1995).*

Chemical Fume Hoods

Laboratory fume hoods should be used whenever manipulating materials which generate hazardous or noxious vapors, fumes, and or dusts. It is a fire and chemical resistant enclosure with one opening in the front with a movable sash. Air is drawn into the front opening at a velocity of 80-100 feet per minute.

■ **Procedure**

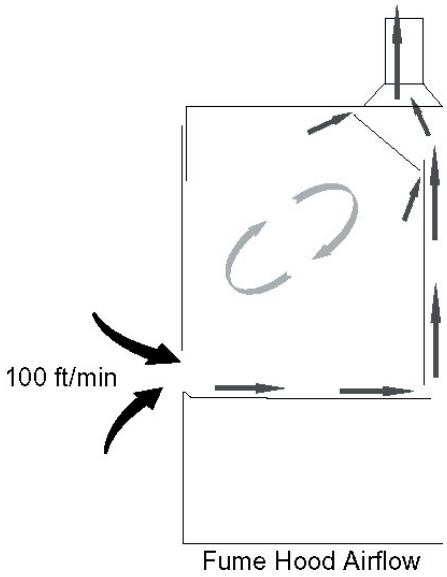
1. Turn fume hood on; check for proper air movement.
2. Place work material at least 6” inside hood, behind the “plane” of the hood sash.

3. Lower glass shield to certification mark or lower.
4. Perform work slowly, entering “straight” into the hood; do not make large sweeping motions within the hood or upon exiting.
5. Remove materials from hood when work is completed; allow hood to run for 10-15 minutes before turning off.

- **Safe Operations**
  - **Do Not** use fume hoods to store chemicals; keep them clean and uncluttered.
  - Use only inspection certified chemical fume hoods.
  - Do not use hoods to dispose of hazardous volatile materials by evaporation.

Need an MSDS?

http://intranet.cdc.gov/ohs/ALERTS/ALERT2.HTM



- Place materials well within the cabinet and not on the front grill.
- Never place your head inside an operating fume hood to check equipment.
- Monitor and anticipate disruptions to the laminar airflow.
- Alert other persons in your work area to limit their movements around the cabinet and the opening/closing of doors within the room.
- Elevate equipment within the fume hood to allow proper airflow across the hood surface.
- Report suspected malfunctions promptly to the Office of Health and Safety (404-639-2453).
- Check with RSO before using radionuclides.

More Information?

■ *Prudent Practices in the Laboratory: Handling and Disposal of Chemicals*, *Nat. Academy Press (1995).*

Chemical Waste Disposal

■ **Procedures**

1. Only ***"certified chemical waste managers"*** may dispose of hazardous chemical waste.
2. Keep container tightly closed.
3. Complete form CDC 0.886, "Hazardous Chemical Waste for Disposal," taking care to indicate building and room where waste is located. Do not use trade or product names when describing waste constituents. To surplus chemicals, use CDC form 0.1240, "Material for Recycling", to recycle chemicals, use CDC form 0.1239, "Chemical Surplus and Request".
4. Send top copy to the OHS Environmental Program, mail stop A17 when ready for pickup.
5. Peel backing off label and attach to the waste container. Do not cover up the original container label.
6. Mark "xx" through label if original container is not used.
7. For empty chemical containers, remove CDC chemical tracking system bar code stickers and affix to the "Chemical Disposition Form" or send "Form" to OHS Environmental Program (MS - A17) to request a pickup.

■ **Safe Operations**

- **Do Not** pour chemicals down the drain!
- Know hazards of waste chemicals and where appro-

priate PPE.

- **Do Not** mix incompatible chemicals.
- **Do Not** discard containers without first removing theImP²ACT “bar code” label.

More Information?

- **“**Chemical Waste Handling and Disposal Guide”
- **“**OHS Environmental Program - 404-639-3417

Packing and Moving Chemicals

- **Procedures**

1. Leave no chemicals behind when moving.
2. Laboratorians will pack and move their own chemicals.
3. Review chemical spill clean-up procedures before packing and moving.
4. Wear appropriate PPE (lab coat, gloves, eyewear) and be familiar with chemical(s) MSDS before beginning work.
5. Survey chemicals for “old” ones which might be peroxide formers, i.e. isopropyl ether, butadiene, potassium metal, sodium amide etc.
6. Segregate and box chemicals into the following groups: organics, inorganics, acids, bases, oxidizers, reducers, and flammables.
7. Separate glass bottles and jars to prevent breakage using cardboard or vermiculite (obtain from OHS).
8. Cap gas cylinders and move using a cylinder truck.
9. Excess all unneeded chemicals. Damaged or open bottles should be treated as hazardous waste and disposed. Unopened bottles should be placed into the OHS Chemical Redistribution Program.

- **Safe Operations**
  - **Do Not** allow movers or clerical personnel to box chemicals!
  - Consider what you would do if you had a spill.
  - **Do Not** mix incompatible chemicals.

• **Chemicals which have not been used for a year should be considered excess and discarded**.

More Information?

- Hazardous Waste Forms
- **“**Chemical Waste Handling and Disposal Guide”
- **“**OHS Environmental Program - 404-639-3417

ImP²ACT -Improved Pollution Prevention Acquired through Chemical Tracking

- **CDC Chemical Tracking Program -** A program which places bar codes on all chemicals and other hazardous materials as they become CDC property, tracks them throughout their use and final disposal and creates a data base with many benefits for CDC laboratorians:

1. **Chemical Sharing** - search the data base for a specific chemical and identify the owner, location, and amount of chemical on hand.
2. **Material Safety Data Sheets (MSDS)** - search the data base for a specific chemical and view/print the latest manufacturer specific MSDS for that chemical.
3. **Personal Monitoring** - OHS’s Industrial Hygiene Section will query the data base for particularly hazardous chemicals and OSHA regulated carcinogens. Laboratorians found to be working with or exposed to these chemicals will have a personal monitoring pro-gram developed for them. The specific program will be developed based upon the nature of the hazard.
4. **Automated Chemical Inventories** - produce an inventory report of chemicals on hand using various filters, i.e. owner, organization, manufacturer, building, room, date purchased, etc.
5. **Chemical History** - shows the known history of the chemical including date purchased, owner, and shelf life. This will help in disposing or recycling of an unwanted or “inherited” chemical prior to its expiration date. Thus, accumulation of expensive orphaned unknowns- can be avoided.

- **Tracking Forms**

1. **Chemical Disposition Form** - notifies OHS when a haz-

ardous chemical material container becomes empty, thus updating the system and removing the chemical from the CDC inventory. Simply remove the CDC bar code sticker(s) from the empty container and affix it/them to the Chemical Disposition Form, and submit it to the Environmental Program. Or, simply check the block requesting that the empty container(s) be removed from your laboratory by the CDC hazard-ous waste contractor.

2. **Chemical Status Form** - used to update the tracking system as to when a bar coded container is relocated or transferred to another individual. Simply complete the form and submit to the Environmental Program.

Chemical Emergencies

- **Surface Contamination**

1. Define spill area.
2. Isolate spill area with closed/locked doors and appro-priate signage.
3. Alert co-workers; evacuate area if spill is large (> 1 gallon) or of extremely hazardous material.
4. Obtain cleanup materials from green “Chemical Spill” cabinet: PPE, dikes, absorbent/neutralizers, disposal scoops/containers, directions (acids, bases, solvents, and mercury).
5. Treat spill.
6. Place contaminated materials in properly labeled waste container for disposal.
7. Report all spills to OHS Environmental Program Manager (404-639-3417).
8. Notify OHS Chemical and Physical Hazards Branch (404-639-3142) of need to replenish chemical spill cabinet.

- **Personnel Contamination**

1. Alert co-workers.
2. Remove contaminated clothing.
3. Flush (eyewash, shower, sink) affected area with copious amounts of water for 15-20 minutes.
4. Apply first aid if needed.
5. Report to OHC.
6. Follow “On-the-Job Injury/Illness Reporting Procedures.
7. Notify supervisor, OHS and the OHS Environmental Program Manager (404-639-3417) if there was also a surface spill to be cleaned up.

- **Fire** - if you detect fire and/or smoke

1. Alert co-workers.
2. Close doors and pull nearest fire alarm.
3. Call 9-911 and security desk at your location.

To Check Chemical Compatabilities

NOAA Chemical Reactivity Worksheet

http://response.restoration.noaa.gov/chemaids/react.html

Safety Incident

Delivery person drops a box containing two 4-liter bottles of xylene in the atrium of building 15, breaking one of the bottles. Delivery person leaves the scene without notifying anyone. Several laboratorians walk by, over, and around the spill before calling OHS to clean up the spill.

4. Use fire extinguisher if trained and fire is small.
5. Clean up.
6. Notify supervisor and OHS.

More Information?

- OhASIS - http//intranet.cdc.gov/ohs
- **"**OHS Environmental Program - 404-639-3417

Radiation Safety

- **Guidelines**

1. **All** laboratorians who work with radioactive materials **must** attend the two day CDC radiation safety course, "Radiation Safety in the Laboratory." Laboratory workers who must work in areas where radioactive materials are used and/or stored, **must** take a one day "Radiation Safety" course to become "authorized laboratorians".

2. **All** users of radioactive materials must be either an "authorized user" (persons with an extensive knowledge-edge of radioactivity and safe working procedures) or work under the direction of an approved "authorized user".

3. **All** radiation workers **must** wear personnel monitoring devices and are encouraged to review their dosimetry records annually with the RSO.

4. **All** users of radioactive materials **must** keep records or surveys, inventories, orders, and packing slips.

5. "Authorized users" or their alternates are the only persons who may order radioactive materials.

6. The CDC/OHS RSO **must** approve all requests for purchases of radioactive materials. ***Credit cards are not to be used for purchase of radioactive materi-als.***

7. **All** users of radioactive materials will submit inventory reports to the CDC/OHS RSO on July 1, November 1, and March 1 of each year.

8. Laboratory surveys are to be performed monthly, recorded, and placed in the user's radioisotope "logbook". Copies will be submitted to the CDC/OHS RSO on October 1, February 1, and June 1 of each year.

9. **Requests for radioactive waste pickups must be made through the CDC/OHS RSO.**

10. **All** radiation meters will be calibrated annually by the CDC/OHS RSO.

11. **All** laboratories using radioactive materials must have a "CDC Radiation Safety Manual" and "Log" book.

12. **All** laboratorians who work with and/or around radioactive materials should read and understand "NRC Form 3,

Notice to Employees".

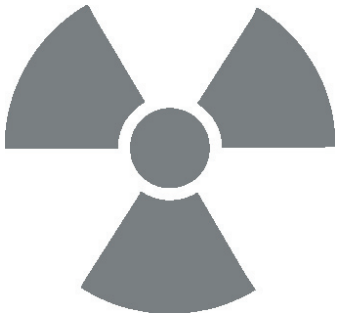
■ **Standard Practices** (in addition to chemical standard practices)

1. **All** laboratories using radioactive materials **must** have a "Caution - Radioactive Materials" door sign.
2. All equipment which comes in contact with radioactive materials must be labeled with the "radiation" symbol or "Caution - Radioactive Materials" sign.
3. Confine radioactive materials to as small an area as possible; perform all work over plastic backed diapers; and mark off the area with "radioactive" tape.
4. For vacuum systems, include a dry ice/ethanol trap in the line between the manifold and the vacuum pump.
5. Wear appropriate PPE including a double set of gloves with wrist guards; change outer gloves frequently- .
6. Use tongs and shielding at all times.
7. Maintain appropriate distance from materials at all times.
8. Perform procedures quickly, efficiently, and precisely.
9. Confine all radioactive materials within clearly labeled and appropriate shielded containers.
10. Wear extremity and whole body dosimeters as needed.
11. Use end-window Geiger-Muller detectors and liquid scintillation counters for radionuclide detection.
12. Regularly monitor your work area for contamination and promptly decontaminate with appropriate radioactive foam/powder wash solution; properly dispose of waste materials.
13. After completing all operations, secure all radionuclides, remove and dispose of PPE, monitor area, decontaminate as needed, wash hands, and monitor again!

■ **Physical Security of Radioactive Materials**

• **Laboratory Areas**

1. All laboratories using radioactive materials **must** have lockable doors. Laboratories without lockable doors may not be used for work or storage of radioactive materials.
2. All laboratories using radioactive materials must be locked at all times when unoccupied.
3. Laboratories where radioactive materials are stored may be unlocked if an authorized person is present at all times.
4. All radioactive materials must be secured when only "unau-



All *materials (incubators, centrifuges, pipettors, etc) which come in contact with radioactive materials* ***must*** *be labeled with the radiation symbol!*

thorized" persons are in the laboratory.
5. Unauthorized persons who need to work in common areas and use common equipment where radioactive materials are used, may become "permitted laboratorians" after attending a one day radiation safety course.

- **Storage**

1. Radioactive materials must be stored in a lock-box secured in a refrigerator/freezer or a locked refrigerator/freezer. Lock-boxes and refrigerators/freezers must be accessible only to authorized users.
2. Radioactive waste materials must also be secured by attachment of free standing waste containers to solid structures. Alternatively, radioactive waste may be stored in lockable cabinets/closets/rooms.
3. Lock-boxes are available from OHS (404-639-4685); lanyards to attach lock-boxes to refrigerators/freezers are available from ESO (404-639-3303). Refrigerators/freezers **must** be cleaned out and decontaminated **before** installation of lock-boxes is scheduled through ESO.

■ Radioactive Waste Disposal

- **Procedures**

1. Individual waste containers should be used for individual isotopes - one container per isotope; separate containers must be used for multiple isotope materials.
2. Solid waste (test tubes, gloves, pipettes, etc.) must be placed in labeled plastic bags and sealed with "radioactive" tape; sharps must be placed in labeled puncture-proof "sharps containers".
3. Store waste containers in lab areas where they are unlikely to be disturbed or knocked over.
4. Complete form CDC 0.999, "Radioactive Waste for Disposal" taking care to indicate radioisotope name, activity and date of disposal, and affix to the waste container.
5. Contact the CDC/OHS RSO (404-639-3145) for waste pickup; the CDC/OHS RSO **must** be notified and pre-approve all waste material for pickup by the CDC/OHS contractor.

- **Safe Operations**

- **The RSO must pre-approve all radioactive waste for disposal!**
- **Do Not** pour radioactive materials down the drain without consulting with the RSO!
- Glass waste containers will not be accepted.
- Include additional information about waste material pertaining to chemicals/microbiologicals involved.

- **All** radioactive waste **must** be secured within the laboratory.

- **Radioactive Emergencies**
  - **Surface Contamination**

1. Define spill area.
2. Isolate spill area with closed/locked doors and appropriate signage.
3. Alert co-workers, put on appropriate PPE, and obtain "Laboratory Spill Kit" for radioactive materials.
4. Cover the spill area with absorbent material to prevent spreading; if biological agents are involved, soak area with disinfectant for 30 minutes.
5. Remove absorbent, place in appropriate waste container, and reapply absorbent if needed; always wipe inward toward the center of the spill.
6. Place contaminated materials in properly labeled waste container for disposal.
7. If you leave area or at completion of spill cleanup, remove **all** protective/contaminated clothing and place in appropriately labeled waste containers.
8. Wash all contaminated skin areas thoroughly (**no vigorous scrubbing**) with cool water and mild soap for 5-10 minutes; repeat as needed following body survey with appropriate detector.
9. Do not leave the area until you have been cleared for exit by someone from OHS.
7. Report all spills to CDC/OHS Radiation Safety Officer (404-639-3415).

More Information?

- CDC Radiation Safety Officer - Paul Simpson (404-639-3145)
- CDC Deputy Rad. Saf. Officer - Narvaez Stinson (404-639-3416)
- CDC Radiation Comm. Chair - Bill Bellini (404-639-4183)

All *radiation laboratories must have copies of the "CDC Radiation Safety Manual" and "Log Book".*

*Personnel monitoring devices **must** be worn by all laboratorians working with and around radioactive materials.*

Appendices

Lab Waste Decontamination Requirements

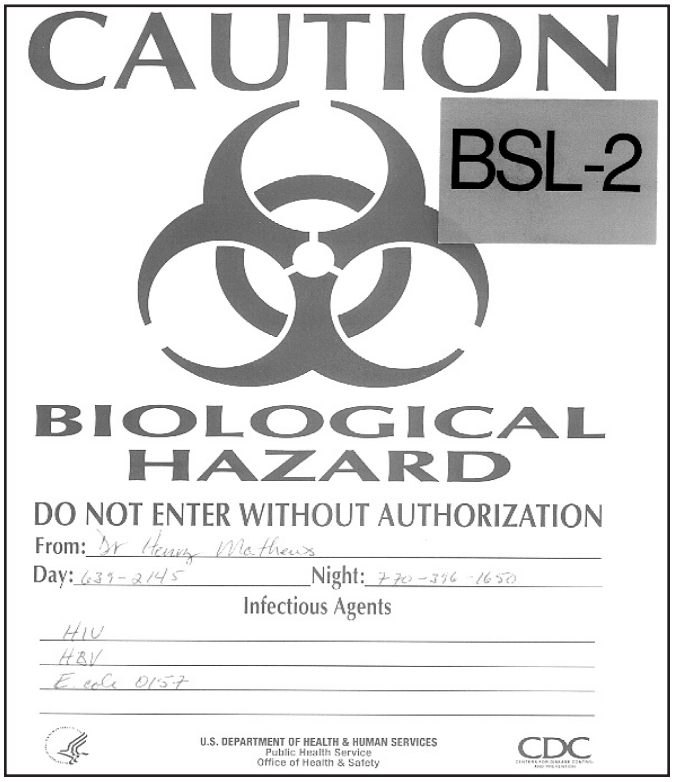
Waste Type	Autoclave Pan	Autoclave Bag	Sharps Container	~250ml H_2O	Cover	Autoclave Tape	Bldg/Rm #
Non-Contaminated							
Reusable Glass-ware	X						X
Contaminated							
Glassware	X			X	X	X	X
Disposable	X	X		X	X	X	X
Single-Use	X	X		X	X	X	X
Needles/ Syringes			X	X	X	X	X

1. <u>Do Not</u> place plastic labware, gloves, or other lab waste into "office waste" cans.

2. <u>ALL</u> waste containers must be properly labeled to be processed by Scientific Resources personnel.

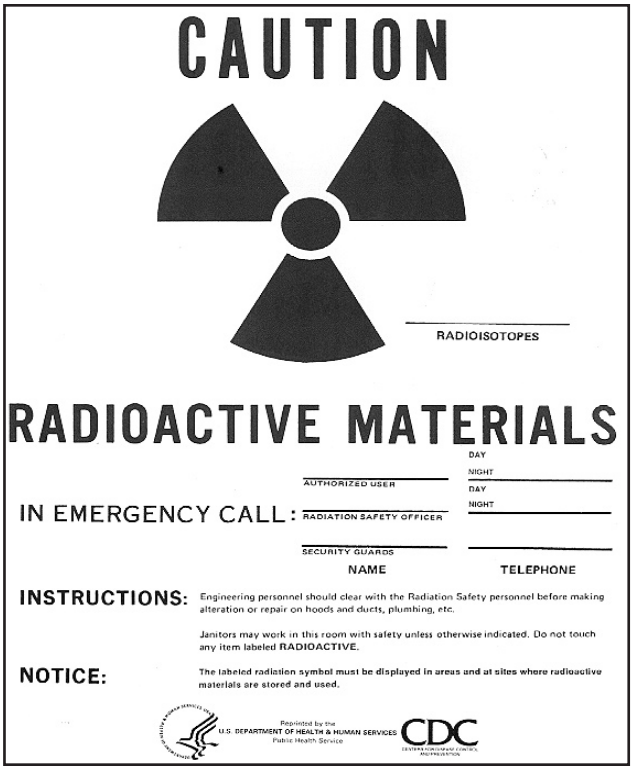
3. Each autoclave run should contain a "Steam Sterilizer Integrator Strip".

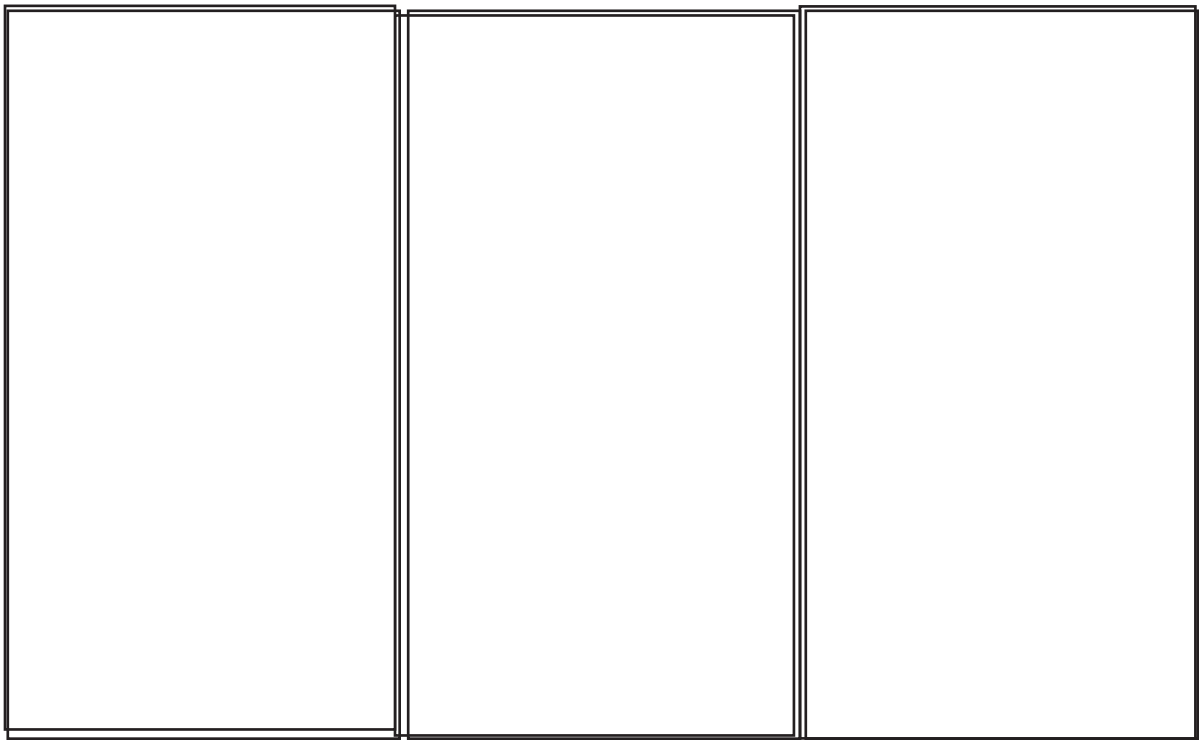
4. Further information:
Technical Services Branch, SRP404-639-3202
Biosafety Branch, OHS404-639-2753



Required of all laboratories where work with potentially infectious microorganisms is performed and designates the biosafety level to be observed for entry

Required of all laboratories where radioactive materials are used or stored

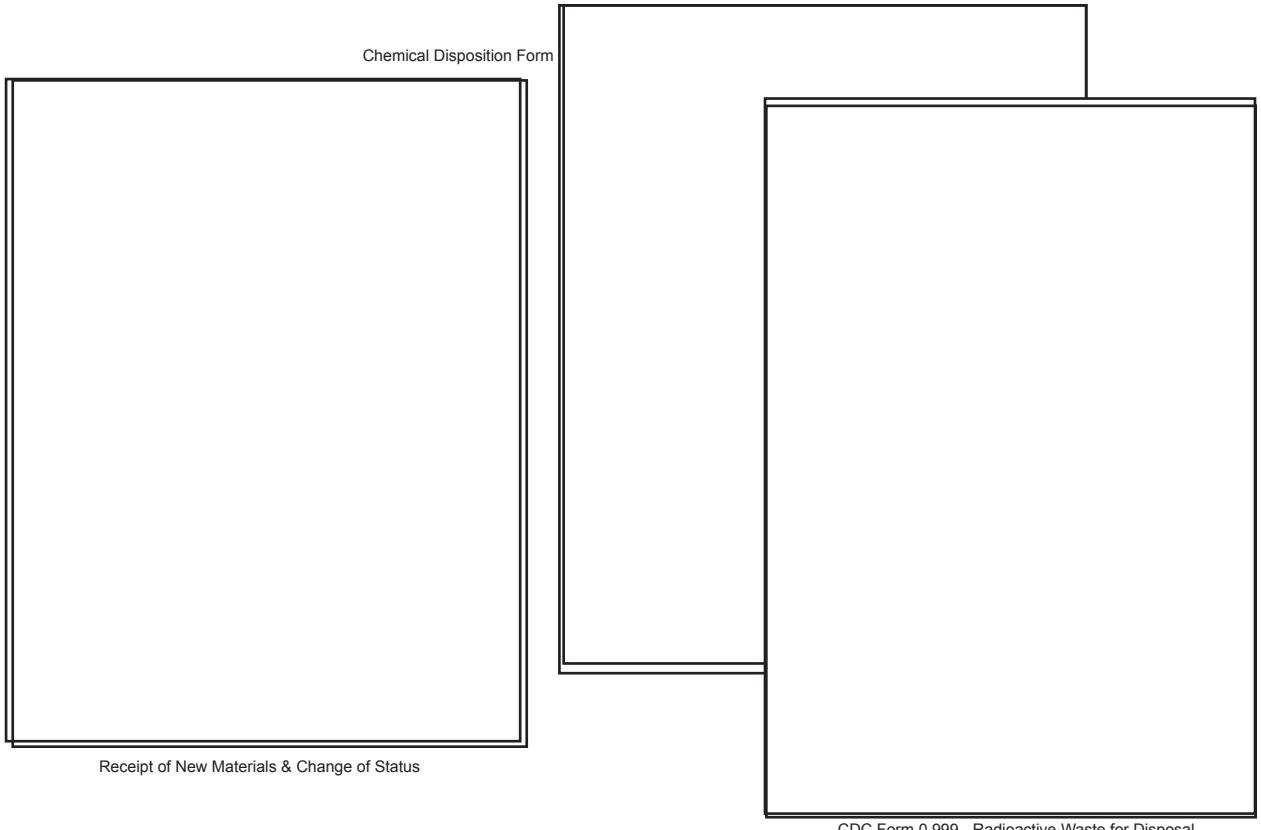




CDC Form 0.886
Hazardous Chemical Waste
for Disposal

CDC Form 0.1239
Chemical Surplus
and Request

CDC Form 0.1240
Material for Recycling



Chemical Disposition Form

Receipt of New Materials & Change of Status

CDC Form 0.999 - Radioactive Waste for Disposal

To obtain copies of forms, call 404-639-3041.

CDC PACKAGING/SHIPPING INFORMATION

All biological and chemical reagents, clinical/diagnostic specimens, and infectious substances that are to be shipped locally, nationally, or internationally by CDC staff must be packaged by the Shipping Activity of the Scientific Resources Program (SRP), NCID. Adherence to this policy ensures that all shipments are packaged according to USPS, DOT, and IATA regulations, and that a record is made of the shipment.

The Shipping Activity is located in Bldg. 1, Rm. SB235. All questions can be directed to:
Ms. Yvonne Stifel (404-639-3355) or
Mr. Cedric McCollins (404-639-3730/3731).

When requesting shipping services, the following process must be followed:

I. Required Forms

A.A "Request for Shipment" (Form CDC 57.7) is required for all shipments.

B.For nonhazardous materials shipped via U.S. Postal Service, one (1) address label per box is required. Include your name, Mail stop (M/S), and complete telephone number. Also include consignee's name, company/institution name, complete shipping address and telephone number.

C. For nonhazardous material shipped via Government Bill of Lading (e.g., Federal Express, DHL, etc.), only a completed form CDC 57.7 is required.

D. For hazardous material shipped via Government Bill of Lading, one (1) address label per UN Certified 6.2 Infectious Substances Kit is required. Include your name, M/S, and a complete telephone number. Also include consignee's name, company/institution name, complete shipping address and a complete telephone number.

E. For Biosafety Levels 3 and 4 infectious substances a "Tracking Document" (Form CDC 0.1076) also is required.

F. For Select Agents shipments (applies only to domestic shipments) form EA 101 along with pre-approval is required from Dr. Richard Knudsen, OHS (404-639-3238) or Joanne Jones, OHS (404-639-2753). The list of Select Agents is attached.

G. For all International Shipments, a "Declaration for Export" (Form CDC 50.117) is required. This form must be completed in triplicate. All exports must be approved by Ms. Yvonne Stifel, CDC Export Coordinator, prior to packaging. This includes all materials that will be hand-carried and/or packed in luggage or carried as extra baggage. In the absence of Ms. Stifel, Mr. Curtis Taylor or Mr. Ed Snow will approve shipment.

II. Pre Packaging

A. All infectious substances must be packaged in UN Certified 6.2 Infectious Substances containers. These containers are available from the Shipping Activity in various sizes. Each UN Certified container has a "maximum limit" for the volume of infectious substances.

B. Any infectious substance to be transported to the Shipping Activity must be prepackaged as follows:

1. The lid of the "Primary Container" (e.g., tube, vial, plate, flask, etc.) must be secured with tape, and the container must be properly labeled with the name of the infectious substance that it contains.

2. The "Primary Container" must be placed into the UN Certified 6.2 "Secondary Con-tainer" (obtained from the Shipping Activity) using the absorbent material and pouch, or bubble wrap provided with the UN Certified Container.
3. Secure the top of the "Secondary Container".
4. Affix the rectangle red and white "etiological agent/biomedical material" label to the "Secondary Container." Also affix a label listing the contents of the container (must include complete scientific name and volume).
5. Place the "Secondary Container" in the provided Outer UN Certified 6.2 packaging.
6. Do NOT place any dry ice in the "Primary or Secondary Containers."

III. Transport the prepackaged shipment to the Shipping Activity (Bldg. 1, Rm. SB235) along with the completed "Request for Shipment" (Form CDC 57.7) and your completed address label (including your name, complete telephone number and mail stop). Also include the recipient's complete shipping address and telephone number.

SELECT AGENTS

Viruses:

1. Crimean-Congo haemorrhagic fever virus
2. Eastern Equine Encephalitis virus
3. Ebola viruses
4. Equine Morbillivirus
5. Lassa fever virus
6. Marburg virus
7. Rift Valley fever virus
8. South American haemorrhagic fever viruses (Junin, Machupo, Sabia, Flexal, Guanarito)
9. Tick-borne encephalitis complex viruses
10. Variola major virus (Smallpox virus)
11. Venezuelan Equine Encephalitis virus
12. Viruses causing hantavirus pulmonary syndrome
13. Yellow fever virus

Exemptions: Vaccine strains of viral agents (Junin Virus strain candid #1, Rift Valley fever virus strain MP-12, Venezuelan Equine encephalitis virus strain TC-83, yellow fever virus strain 17-D) are exempt.

Bacteria:

1. Bacillus anthracis
2. Brucella abortus, B. melitensis, B. suis
3. Burkholderia (Pseudomonas) mallei
4. Burkholderia (Pseudomonas) pseudomallei
5. Clostridium botulinum
6. Francisella tularensis
7. Yersinia pestis

Exemptions: Vaccine strains as described in Title 9 CFR, Part 78.1 are exempt.

Rickettsiae:

1.Coxiella burnetii
2.Rickettsia prowazekii
3.Rickettsia rickettsii

Fungi:
1.Coccidioides immitis

Toxins:
1.Abrin
2.Aflatoxins
3.Botulinum toxins
4.Clostridium perfringens epsilon toxin
5.Conotoxins
6.Diacetoxyscirpenol
7.Ricin
8.Saxitoxin
9.Saxitoxin
10.Staphylococcal enterotoxins
11.Tetrodotoxin
12.T-2 toxin

Exemptions: Toxins for medical use, inactivated for use vaccines, or toxin preparations for biomedical research use at an LD50 for vertebrates of more than 100 nanograms per kilogram body weight are exempt. National standard toxins required for biological potency testing as described in 9 CFR Part 1143 are exempt.

Recombinant organisms/molecules:
1.Genetically modified microorganisms or genetic elements from organisms on Appendix A, shown to produce or encode for a factor associated with a disease.
2. Genetically modified microorganisms or genetic elements that contain nucleic acid sequences coding for any of the toxins listed in this Appendix, or their toxic subunits.

IATA SHIPPING REGULATION CHANGES

for Infectious Substances and Clinical/Diagnostic Specimens

The International Air Transport Association (IATA) changed their regulations for packaging and shipping infectious substances and clinical/diagnostic specimens on January 1, 1997. These changes are described in detail in the 38th edition of the IATA Dangerous Goods Regulations. In general, all packages that are being shipped by air via commercial and cargo carriers such as Federal Express and passenger aircraft are affected by the following changes:

(1) The definition for Infectious substances has been revised to read, "Infectious substances: Substances known to contain, or reasonably expected to contain, pathogens. Pathogens are microorganisms (including bacteria, viruses, rickettsia, parasite, fungi) or recombi-nant micro-organisms (hybrid or mutant) that are known or reasonably expected to cause infectious dis-ease in humans or animals."

(2) Some of the elements in the three categories of the Classification of Clinical/Diagnostic Specimens have also been changed:

(A) Those known or reasonably expected to contain pathogens are now to be classified as infectious substances. When these specimens are transported/shipped for any purpose including initial or confirmatory testing for the presence of pathogens they are to be pack-aged and shipped as infectious substances.

(B) Specimens that have a relatively low probability to contain pathogens are to be classi-fied as clinical/diagnostic specimens. When these specimens are transported/shipped for the purpose of routine screening tests or initial diagnosis for other than the presence- of pathogens they are to be packaged and shipped as clinical/diagnostic specimens.

(C) Those specimens known not to contain pathogens are to be packaged and shipped as non restricted, i.e., packaging and shipping is not regulated. They are to be packaged in water-tight primary containers and leak-proof secondary containers.

Unless it has been specifically determined, i.e., by testing, that a clinical/diagnostic specimen does not contain a pathogen(s), it is considered to fall within either those specimens known or reasonably expected to contain pathogens or those specimens that have a relatively low prob-ability to contain pathogens.

Immediately all clinical specimens are to be packaged and shipped according to these IATA Dangerous Goods Regulations. For all clinical specimens not marked as infectious on The Request for Shipment form CDC 57.7 as infectious, an additional form will be required for each shipment and must include the following information:

Name of requester
Name of recipient
City, State (Country) of recipient
End use:

1. Initial or confirmatory testing for pathogens, complete scientific name of pathogen
2. Antibody assay
3. Other screening

Note: When bringing infectious substances or specimens reasonably expected to contain infectious substances to the Shipping Activity, please pre-pack in the approved UN Certified 6.2 Infectious Substance shippers.

The forms described above and the UN Certified Shippers for infectious substances and clinical specimens are available in the Shipping Activity Bldg 1-SB235; phone number 404-639-3730.

SAMPLE OF FORM:

_____

CLINICAL SPECIMEN SHIPMENTS

(For clinical specimens not marked as infectious on form CDC 57.7)

Name of requester_____

Name of recipient_____

City, State (Country) of recipient_____

End use (check one):

____ 1) Initial or confirmatory testing for pathogens

Complete scientific name of pathogen_____

____ 2) Antibody assay

____ 3) Other screening

EXPORT CONTROLS FOR BIOLOGICALS, CHEMICALS, AND RELATED TECHNICAL DATA AND EQUIPMENT

I. PURPOSE

This guide revises the established CDC policy for the exportation by CDC of all commodities to foreign countries. In addition, it provides an attachment with export-related terms and definitions that employees may find helpful in understanding the export process.

II. BACKGROUND

The Department of Commerce (DOC), Bureau of Export Administration, regulations (15 CFR, Parts 730 through 799) control the export of commodities to foreign countries and require that all exports be shipped under either a general or validated license. This requirement impacts on CDC's scientific exchange with countries when exporting supplies, biologicals, etiologic agents, chemicals, equipment, and technical data. Exports to certain foreign countries as well as the export of some commodities are restricted. The lists of commodities and countries are subject to change. To ensure compliance with DOC regulations, CDC has established policies for all exports. These policies and procedures are described in this issuance.

III. REFERENCE

15 C.F.R. Parts 730-799

IV. POLICY

All applications to export biologicals, etiologic agents, chemicals, equipment, supplies, and technical data from CDC must be coordinated through the National Center for Infectious Diseases, Scientific Resources Program (SRP). In this coordinating role, SRP will furnish approval of the export, assistance in shipping, and information regarding pertinent requirements under DOC regulations.

V. EXPORT PROCESS

A. Requests to Export

All requests to export commodities including biologicals, etiologic agents, chemicals, equipment, supplies, and technical data are to be submitted on Form CDC 50.117, available from the Export License Coordinator. The request should be sent to:

Export License Coordinator, Mail Stop C-21
Scientific Resources Program (SRP)
National Center for Infectious Diseases

B. License Requirements

The Scientific Resources Program, Export License Coordinator, will review all requests to determine export licensing requirements. All commodities must be shipped under one of three categories.

No License Required (NLR):

NLR is a symbol marked on the shipping container(s) and entered on the Shipper's Export Declaration and other shipping documents, certifying that no license is re-quired. It is used for commodities not controlled by the Export Administration Regulations, such as laboratory supplies.

Individual Validated License (IVL):

An Individual Validated License is the authority issued by the Bureau of Export Administration (BXA) authorizing an export. It is used for commodities controlled by the BXA, such as specific infectious substances and all exports to embargoed coun-tries.

License Exception:

License Exception is an authorization described in the Export Administration Regula-tions (EAR) that allows CDC to export, under specifically defined conditions, items subject to the EAR that would otherwise require a license. Unless otherwise indicated, these License Exceptions are not applicable to exports under the licensing jurisdiction of agencies other than DOC. The only License Exception for infectious substances is Canada. There are no License Exceptions for exporting to an embar-goed country.

In most instances international shipments of commodities by CDC can be exported under a "no license is required" method or occasionally under a DOC License Exception, and the approval for the export can be done quickly.

Technical data and technical expertise can be exported under License Exceptions or Individual Validated Licenses, as appropriate. In addition, technical data and techni-cal expertise described in the DOC regulations as "publicly available" can be ex-ported under "no license required" by the originator without completion of Form CDC 50.117. If there is a question of whether the technical data/expertise meets this definition of "publicly available," contact the Export License Coordinator.

When an Individual Validated License is required, the Export License Coordinator, acting as liaison to DOC, will obtain the appropriate license on behalf of the requester. Shipments requiring an Individual Validated License will be delayed pending receipt of the license. Additional information is required for an Individual Validated License: specific end use, end user(s), and a Curriculum Vitae for the end user(s). For biosafety levels 3 and 4 infectious substances, the requester must submit a letter, facsimile, or e-mail stating that the end user(s) has the expertise required and the laboratory has the appropriate contain-

ment facilities required to work with biosafety levels 3 and 4 microorganisms.

C. Shippers Export Declaration (SED) and Import Permits

When a SED is required to accompany the shipment, the Export License Coordinator will complete the form. Because of the information and research required to complete this form, the shipment can be delayed for a few days.

Some foreign countries require import permits for human biological products and infectious substances. The consignee should know if an import permit is required and is responsible for obtaining and providing the import permit to the requester. A FAX of the import permit is sufficient for the shipment.

D. Riders and Conditions

After obtaining the necessary Individual Validated License, the SRP Export License Coordinator will notify the requester of the receipt of the license and the riders and conditions that apply to it. It is the responsibility of the requester to obtain from the end user a signed, written statement verifying the end user's agreement to the riders and conditions of the license. The shipment cannot be processed without this verification. Once acknowledgment and agreement to the riders and conditions of the license have been received from the consignee, a projected shipping date and arrangement to send the commodities to the Shipping Activity will be made. These arrangements will be coordinated between the requester, the Transportation Specialist (PGO), and the Export License Coordinator.

E. Shipment

Upon receipt of the commodity, the Shipping Activity, will package and mark the outer shipping container(s) as required by the DOC under either a License Exception or an Individual Validated License.

VI. RESPONSIBILITIES

A. Export License Coordinator:

-Approves all exports before materiels leave CDC.
-Ascertains the proper export license for requesters.
-Obtains Required Licenses.
-Coordinates packaging, labeling, and shipping.
-Maintains a log of all exports to include: Individual Validated Licenses, import documentation, Shipper's Export Declarations, consignee's agreement to the riders and conditions to an IVL and all other documents related to export commodities except for Air Waybills, commercial invoices, bills of lading, and other documents related to transportation of the export which will be maintained by the Transportation Specialist, Procurement and Grants Office (PGO).

- Submits export records to DOC, upon request.

B. Requester

- Ensures that forms CDC 50.117 (Declaration for Export of Biologicals, Chemicals, Equipment, or Technical Data) and CDC 57.7 Request for Shipment (if applicable) are completed.
- Submits both forms to the Export License Coordinator.
- Provides all other necessary information to the Export License Coordinator required to process the export request.
- Provides the consignee's agreement to the Riders and Conditions of the IVL to the CDC Export License Coordinator.
- Communicates the shipping arrangements, air waybill number, etc., to the consignee.

C. Directors, D/P/O Management

All levels of management are responsible for ensuring that every person in their organization complies with this policy. This is essential to maintain prompt shipments of commodities and ensure CDC's compliance with applicable laws and regulations.

D. Transportation Specialist, PGO

- Arranges for the transportation of the shipment after the CDC Export License Coordinator has approved the export.
- Provides the Export License Coordinator with appropriate information for the Shipper's Export Declaration.
- Enters the "destination control statement" on the shipping documents including all copies of the bill of lading, the air waybill and the commercial invoice covering any export from the United States.
- Maintains files containing air waybills, commercial invoices, bills of lading, and other documents relating to the transportation of the export.

EXPORT-RELATED TERMS AND DEFINITIONS

Biological Product: A biological product is a medicinal preparation made from living organisms and their products, including serums, vaccines, antigens, antitoxins, etc.

Chemical: A chemical is a substance composed of chemical elements or obtained by chemical processes.
Commodity: A commodity is an article, material, or supply except technology and software.
Consignee: A consignee is the recipient of the shipment.
Destination Control Statement: The destination control statement (DCS) is used to prevent items from being diverted while in transit or thereafter. It is prohibited to knowingly divert any export to circumvent the Export Administration Regulations. The DCS must be entered on all copies of the bill of lading, the air waybill and the commercial invoice covering any export from the United States. Text of DCS: "These commodities, technology or software were exported from the United States in accordance with the Export Administration Regulations. Diversion contrary to U.S. law prohibited."
End Use: The end use is the specific purpose of the export, i.e., what will the consignee do with it.
End User: The end user(s) is all the individuals, groups, or organizations that will use the export.
Equipment: Any instrument or mechanical or electrical devise used in a biological and/or chemical laboratory.
Etiologic Agent: An etiological agent is any substance containing viable micro-organisms including a bacterium, virus, rickettsia, parasite, fungus, or a recombinant, hybrid or mu-tant, that are known or reasonably believed to cause disease in humans or animals. Some etiologic agents are controlled commodities and may not be shipped without an individual validated license.
Export: An export is the actual shipment or transmission (e.g., hand-carried, excess baggage, packed in luggage, etc.) of items out of the United States.
Individual Validated License: An Individual Validated License is a license issued by the Bureau of Export Administration for a specific controlled commodity in a specific amount to be shipped to a specific person or end user for a specific use.
License Exception: A License Exception is an authorization that allows CDC to export under stated conditions, items subject to the Export Administration Regulations (EAR) that would otherwise require an Individual Validated License.
Publicly Available Information: Information that is generally accessible to the interested public in any form and, therefore, is not subject to the Export Administration Regulations.
Publicly Available Technology and Software: Technology and software that are already pub-lished or will be published, arise during or result from fundamental research, are educa-tional, or are included in certain patent applications.
Riders and Conditions of the License: Each Individual Validated License comes with specific riders and conditions attached that CDC and the consignee are required to follow. A signed statement from the consignee agreeing to these riders and conditions is required before the shipment can be made.
Shipper's Export Declaration (SED): A Shipper's Export Declaration (SED) is required for ship-ments with a fair market value over $2500 and/or for specific countries sited in the U.S. DOC Export Administration Regulations. The SED is completed by the Export License Coordinator.
Technical Data: Specific information necessary for the "development," "production," or "use" of a product.
Technical Expertise: Technical expertise is instruction, skills training, working knowledge, or con-sulting services necessary for the "development," "production" or "use" of a product. Technical

expertise for commodities requiring an Individual Validated Export License also requires an Individual Validated Export License.

Occupational Health Clinic (OHC)

CDC and ATSDR Clinic Services

The Atlanta based CDC and ATSDR Clinic provides preventive health services such as first aid, administration of job related vaccinations, employee counseling, lifestyle programs, etc., to employees. It's recognized that such employer-sponsored preventive health programs help to promote and accomplish the mission of the agency by reducing the use of sick leave, fostering the continuity of work projects, increasing employee productivity, etc. Accordingly, CDC and ATSDR has elected to extend the coverage of occupational-related clinic services for CDC-unique hazards and emergency first aid to non-Federal employees, including on-site contractors at CDC and ATSDR facilities in Atlanta. For eligibility determinations, contact Tammy Gorny at (404) 639-3237.

The other clinic services to be offered to non-Federal employees at CDC and ATSDR cannot incur any additional costs and will be on a space/resource availability basis. Space available services mean that appointments for the clinic and Employee Assistance Program will be limited to Federal employees while non-Federal personnel may be provided occupational related clinic services on a walk-in, stand-by basis. For lifestyle activities, CPR classes and similar programs, Federal employees will be provided first availability and non-Federal employees may be offered unfilled activity slots.

In order for on-site contractors to participate in activities which may coincide with their normal work schedules, they must obtain the approval of their contract supervisor beforehand. The contract employers must notify the CDC Project Officer and appropriately credit the contract for the contractors' time away from their function (if more than an incidental amount of time is involved). On-site contractors are those contractors who are physically assigned and located at one of the CDC/ATSDR Atlanta facilities.

MEDICAL EMERGENCIES

If a potentially life-threatening Medical Emergency occurs at the worksite, activate the Emergency Medical System by calling "9-911" IMMEDIATELY. Make arrangements to:

(1) meet the Emergency Responders at the pre-arranged location
(2) provide an escort and access to the location of the employee with the emergency.

OCCUPATIONAL HEALTH CLINIC

Mission

The primary mission of the Clinic is to monitor, prevent, and treat work-related injuries and illnesses. The Clinic also provides non-occupationally related care on a space-available basis. This includes adult immunizations, allergy shots, blood pressure checks, and initial assessment of non-occupational illness that occur during work hours.

Hours and Locations

There are two Clinic facilities. The main Occupational Health Clinic (OHC) is located at Clifton Road and the satellite clinic is at Chamblee.

Site	Location	Building	Room	Coverage	Hours	Phone
Main	Clifton Road	4	121	Full-time MD	M-F, 8am-4:30pm	(404) 639-3385
Satellite	Chamblee	102	1106	Full-time RN	M-F, 8am-4:30pm	(770) 488-7824

OCCUPATIONAL MEDICAL SERVICES

The majority of Clinic patient visits are for immunizations, work-related exams, blood tests, and on-the-job injuries. The employee groups seen most often are laboratorians, international travelers, Engineering Services employees, and animal care workers. To keep waiting times as short as possible, the Clinic operates on an appointment basis for non-emergency needs. Call the
Clinic in advance to avoid delays for yourself and others.

After-hours Exposure Incidents:

(1) HIV and other Retrovirus Exposures

If you experience an incident at work where there is a known or suspected exposure to HIV or other primate retroviruses, you should administer first aid immediately at your work site. The recommended first aid for a skin or wound exposure is:

- Wash or rinse the area immediately.
- Do not delay in doing so by making a phone call or cleaning up a spill.
- If the exposure involves an injury, wash the injured body part with soap and water, and flush with water. If available, you may also soak the wound in an iodine solution (do not use iodine for wounds of the eye, nose, or mouth).
- Contaminated mucous membranes should be irrigated thoroughly with sterile normal saline (if available) or at least water.
- Report the exposure to your supervisor. Because many people become upset and unable to think and act clearly after such an injury, it is recommended that you ask your supervisor or a co-worker to assist you in obtaining medical care.

In the event that an exposure occurs during non-clinic hours, you should contact ***Dr. Phyllis Kozarsky***, infectious disease and tropical medicine specialist:

1. Call the Emory/Crawford Long Hospital at ***404-321-0111***.
2. Identify yourself as a CDC employee and ask them to page Dr. Kozarsky. 3. If you do not reach Dr. Kozarsky within 30 minutes, you should seek care for potential retrovirus exposure at the nearest hospital emergency room.

Any decision to treat the exposure with prophylactic antiviral medication will be made on a case-by-case basis. To have the greatest chance of success, however, such medication should be started as soon as possible after the exposure--within the first hour if possible. Therefore, the exposed person should not delay in seeking medical care.

Finally, you should report the incident to the Occupational Health Clinic when the clinic is next open. We will review the events and your treatment thus far. If the HIV status of the source specimen is unknown, you should try to preserve it and bring it to the clinic for testing.

(2) Other Biological Exposures

If you experience an incident at work where there is a known or suspected exposure to a biological agent, you should administer first aid immediately at your work site if appropriate. The recommended first aid for a skin or wound exposure is:

- Wash or rinse the area immediately.
- Do not delay in doing so by making a phone call or cleaning up a spill.
- If the exposure involves an injury, wash the injured body part with soap and water, and flush with water. If available, you may also soak the wound in an iodine solution (do not use iodine for wounds of the eye, nose, or mouth).
- Contaminated mucous membranes should be irrigated thoroughly with sterile normal saline (if available) or at least water.
- Report the exposure to your supervisor. Because many people become upset and unable to think and act clearly after a biological exposure, it is recommended that you at least discuss what happened with your supervisor. Depending on the seriousness of the exposure, it may also be appropriate to ask your supervisor or a co-orker to assist you in the process of obtaining medical care.

In the event that an exposure occurs during non-clinic hours, you should contact ***Dr. Phyllis Kozarsky***, infectious disease and tropical medicine specialist:

1. Call the Emory/Crawford Long Hospital at ***404-321-0111***.
2. Identify yourself as a CDC employee and ask them to page Dr. Kozarsky.
3. If you do not reach Dr. Kozarsky within 30 minutes, you should seek care for potential retrovirus exposure at the nearest hospital emergency room.

Any decision to treat the exposure with prophylactic medication will be made on a case-by-case basis.

Work-Related Injuries

Treatment of work-related traumatic injuries should be obtained as soon as possible after the injury. Although there will be instances when care is needed urgently, supervisors should fill out a CDC/ATSDR Incident Report (Form CDC 0.304) for the employee to carry with them to

the Clinic.

The supervisor should also assure the completion of the following forms:

1. Department of Labor, Federal Employees' Notice of Traumatic Injury and Claim for Continuation of Pay/Compensation (Form CA-1) and,
2. "Request for Examination and /or Treatment", Form CA-16, If there is the possibility or need for outside medical care for which bills would be incurred.

If possible someone in the worksite should call the Clinic to alert the staff that an injured employee will be seeking treatment.

Occupational Immunizations

Immunizations are available by calling the Clinic to make an appointment and bringing a completed "Immunization Authorization" (Form CDC 0.697) to the Clinic at the time of your appointment. The Form CDC 0.697 is completed by the Immunization Coordinator, who is usually your Administrative Officer. The CDC/ATSDR offers all employees the opportunity to receive immunizations to protect them against specific microorganisms encountered in their workplace and elsewhere.

The Occupational Immunizations Program provides immunizations to those individuals requiring them because of potential occupational exposure to these infectious agents or these products. The program provides these immunizations to laboratory workers, engineering personnel, field
investigators, and other individuals who may be at potential risk of exposure to these agents. The
program also provides a number of immunizations to employees as part of the CDC/ATSDR Adult
Immunization Activity. These include vaccines for Hepatitis B, Influenza, Measles/Mumps/Rubella,
Pneumococcal Disease, and Tetanus/Diphtheria.

Medical Surveillance Programs

The Occupational Health Clinic also conducts the following medical surveillance programs for a
variety of occupational hazards and positions:

- Hearing conservation
- Respirator use
- Asbestos exposure
- Selected chemical surveillance based on personal monitoring results (e.g. ethylene oxide)
- Retrovirus exposure
- Tuberculosis screening
- Animal care

Non-Occupational Illness Visits

The Occupational Health Clinic performs a variety of non-injury, non-occupational preventive medical services for the CDC/ATSDR community at large, such as blood pressure checks and the following routine adult immunizations:

- Hepatitis B
- Influenza
- Measles/Mumps/Rubella
- Pneumococcal Disease
- Tetanus/Diptheria

As a convenience to employees who receive allergy shots, the Clinic administers these injections according to the written instructions of the employee's allergist.

Employees are seen for non-work related illnesses and injuries on a space-available basis. Work-related services are given first priority. Anyone who has a significant, non-work related problem should call his/her private physician directly for non-urgent advice and treatment.

Pre-Travel Visits for International Travel

CDC VISITORS IN THE WORKPLACE POLICY

Sections:

I.INTRODUCTION

Federal Property Management Regulations govern the conduct of visitors in gov-ern-ment owned/leased facilities. Security considerations mandate that all CDC facili-ties be closed to the general public and admission restricted to authorized persons who have business with CDC.1

II.PURPOSE

The purpose of this policy is to provide information to CDC personnel on the policy and procedures to be followed for Visitors in the Work place at CDC.

III.POLICY

It is CDC policy that visitors to CDC must be authorized to enter the property and display appropriate identifying credentials at all times while on the property. This policy does not preclude occasional, brief visits by persons not conducting CDC-related business, e.g., personal friends, relatives, spouses, children, credit union members, etc. All visitors, except those going to the credit union or cafeteria or other unescorted visitor-only areas, must be ac-companied by a CDC employee. Prearranged, pre-approved educational programs and tours of CDC facilities are allowed if children are escorted by parents, chaperones, or CDC employ-ees. However, these events should be kept to a minimum due to security/safety consider-ations and the potential for workplace disruption.

Children under 16 years of age are not permitted into any laboratory, laboratory corridor, animal holding area, engineering shop, or construction area at any time, because of the potential for exposure to health or physical hazards. Exceptions must be cleared through the local safety officer, safety committee, or the Office of Health and Safety.

In addition, each laboratory supervisor is responsible for the safety of visitors to his or her laboratory or work area, including determining that immunization requirements have been met. CDC security policy requires that visitors be accompanied by an employee at

all times while in our facilities. The term employee includes technical and non-technical personnel, guest researchers, and work-study students. Contractors, while not employees, shall adhere to this policy.

CDC is committed to promoting a culture that is supportive of the needs and career aspirations of staff with family responsibilities. Family responsibilities are not con-fined to the private sphere, but impinge on all aspects of an individual's life, includ-ing employment. As an equal opportunity employer, CDC has an interest in support-ing its members to balance the various demands they face as staff and as people with family responsibilities. CDC is committed, therefore, to promoting equity for all staff and to ensuring that individuals are not disadvantaged in their career aspira-tions by family responsibilities. Other complementary guidelines and practices

currently encourage supervisors to be sympathetic to the needs of parents in grant-ing appropriate leave to care for sick children and other family members (e.g., Family Friendly Leave).

Under CDC policy it is understood that despite the range of child care options available to staff throughout the community, there may occasionally be emergency situations requiring staff to bring their children into the workplace. Employees, therefore, should utilize the following guidelines for unforeseen circumstances where alternative arrangements cannot be made. They have been developed to ensure responsiveness on the part of CDC to such situations, and to outline the responsi-bilities of employees who bring children or visitors into CDC facilities. Employees should understand the importance of this policy since the workplace is not designed for children, and CDC may be held liable if a child is hurt or injured. Employees having difficulty with child care arrangements are encouraged to contact the Family Program Manager in the Human Resources Management Office, and/or the Coordi-nator for the CDC Employee Assistance Program. Employees may wish to choose to use an outside resource such as Dependent Care Connection at Telephone No. 1-800-873-4636; their web address is http://www.dcclifecare.com/.

IV.DEFINITIONS

A. Employee

Includes all personnel, including guest researchers, and work-study students.

B. Children

Those under the age of 16.

C. Contractors

Personnel performing contractual services on-site.

V.POLICY IMPLEMENTATION

The following policy applies to all CDC facilities, including owned and leased build-ings.

A. Children in Laboratory Areas, Laboratory Buildings

No children under the age of 16 will be allowed in laboratory buildings or animal facilities. This includes office areas, stairwells and corridors associated with the laboratories, as well as actual laboratories. In consultation with the Office of health and Safety and the Physical Security Office, each CIO Director may assess the risks of selected areas in their facilities and define those areas as accessible by visitors. This consolidates several guidelines that are currently in place concerning access to laboratories using hazardous agents or radioactive material and restricts access to these buildings to those who are potentially eligible for employment (16 is the youngest age that anyone is recruited to the CDC Summer Student Employment Program). The Occupational Safety and Health Committee (OHSC) member for each CIO will designate laboratory areas and laboratory buildings.

B. Children in Office Buildings

For those emergency situations where staff need to bring children to work, children may be in an office for short periods of time (2 hours or less), without prior approval, though the immediate supervisor will be informed. For periods longer than this, approval of the immediate supervisor must be obtained. However, generally no child should be present for a full day. Children come under the same guidelines as other visitors, and should not be left unaccompanied. All children under the age of 12 must be under the direct supervision of their parent at all times. At no time should a child of any age answer the telephone or operate office equipment.

C. Children in Engineering Work Areas, Warehouses, and other High Risk Areas

No children under the age of 16 will be allowed in any construction area, engineering work areas (i.e., workshops, power plants, etc.), warehouses, or other similar high risk areas.

D. Pets in Work Areas

Animals, as defined in Webster's New World Dictionary, shall not be brought upon government-owned/leased property for other than
official purposes. Service dogs, or other service animals used to guide or assist persons with disabilities are exempt.

VI. RESPONSIBILITIES

A. Responsibilities of Supervisors

The employee's immediate supervisor will be informed when a child is to be present in the workplace for short periods of time (2 hours or less). If this presents a prob-lem, the supervisor will immediately inform the employee and negotiate a suitable leave alternative or an acceptable child's stay in an office for longer than two hours. This should be only with the prior permission of the immediate supervisor. Gener-ally, it is not acceptable for a child to be present for a full day.

Supervisors may wish to consult with their Section/Branch/Division Chiefs or

Asso-ciate Directors of Management and Operations (ADMOs) when considering such requests and again, particularly when discussing suitable leave options. Requests to bring children into the workplace should be given careful consideration. Re-quests shall be treated with flexibility and sensitivity. Factors to consider may include the age of the child, the child's health, the length of time involved, the fre-quency of attendance, the work environment, health and safety issues, and the degree of possible interference with other staff. Permission may be immediately

withdrawn should any child be disruptive to the workplace.

Supervisors are encouraged to advance annual leave in emergency situations, credit or compensatory time, sick leave to care for a sick child, or leave without pay.

B. Responsibilities of all Employees

All possible alternatives should be sought to avoid bringing children into the workplace. This is especially the case for occasions that can be anticipated (i.e., child care for children during regularly scheduled school breaks, teacher work days, etc.) where child care arrangements outside of the workplace can be scheduled in advance. These guidelines are intended to address emergency situations where a parent must bring a child to work for short periods when no other alternatives are available. Sick children should not be brought into the workplace. Appropriate leave should be granted so that parents may care for children in such situations.

The immediate supervisor should be informed when a child is to be present in the workplace with as much advance notice as possible, recognizing that it is in the nature of an emergency to be unforeseen. The principle of "reasonableness" will apply to both those requesting and those granting permission. Parents should be sensitive to the needs of colleagues and co-workers and should not expect others to care for their children in the workplace.

When bringing children into the workplace, the needs of other staff to work undis-turbed should be respected. Parents must be aware that the ultimate responsibility for the safety of their children rests with them.

VII. COMPLIANCE

A. While each employee is responsible for abiding by workplace rules, regulations, policies, and guidelines, supervisors are responsible for oversight and compliance.

B. Upon becoming aware of any infractions, employees will be counseled and reminded of the policy. In the event of repeated offenses, violations of this policy may result in disciplinary action.

VIII. REFERENCES

A. CDC General Memorandum No. 85-8, dated March 22, 1985, is superseded.

B. 41 CFR 101-20.3. Conduct on Federal Property.

C. 7 USC, 2131-2156. Animal Welfare Act.

D. 41 CFR 101-20.311. Conduct on Federal Property – Dogs and Other Animals.

E. HHS Instruction 630-1, Leave and Excused Absence.

F. HHS Instruction 751-1, Official Reprimands/Adverse Actions.

G. PL 103-3, Family and Medical Leave Act, February 5, 1993.

1 References to CDC also apply to ATSDR

Laboratory Safety
Final Exam

Worker Name _____ Phone _____
User ID _____

T F 1.When using the chemical fume hood, you should open the sash all the way up to provide maximum access.
T F 2. Class II, type B biosafety cabinets and chemical fume hoods both draw 100 ft/ min of air in through the front opening.
T F 3.Protective eyewear should be worn in the lab only when you are working with hazardous materials.
T F 4. Lab materials (i.e. tubes, flasks, pens, discard pans, etc.) must be decontaminated before leaving the lab.
T F 5. All laboratorians may discard hazardous chemical waste.
T F 6. It is ok to wear clean lab coats out of the lab corridor.
T F 7.All laboratorians may enter laboratories where radioactive materials are being used.
T F 8.Non-contaminated lab waste may be put in any waste container.
T F 9.It is ok to have a snack in the lab as long as you do not put it down.
T F 10.Surgical gloves may be used for all laboratory procedures.
T F 11.Laboratory gloves should be removed and your hands washed whenever you suspect that they have become contaminated.
T F 12. All lab waste to be autoclaved should be placed into red autoclave bags.
T F 13. It is ok to hand carry single specimen tubes from one lab room to another.
T F 14. It is ok to wear sandals in the laboratory.
T F 15. Laboratory chemicals should be poured down the sanitary sewer system.
T F 16. The MSDS will alert you to the hazards associated with a particular microorganism, what kind of PPE to wear, how to deal with contamination, and what to do in an emergency.
T F 17. The chemical fume hood may be used to store chemicals.
T F 18. All “authorized researchers” may work with radioactive materials.
T F 19. CDC chemical spill cabinets are painted “yellow” for high visibility during emergencies.
T F 20. Radioactive materials must be stored in a lock-box or lockable refrigerator freezer.